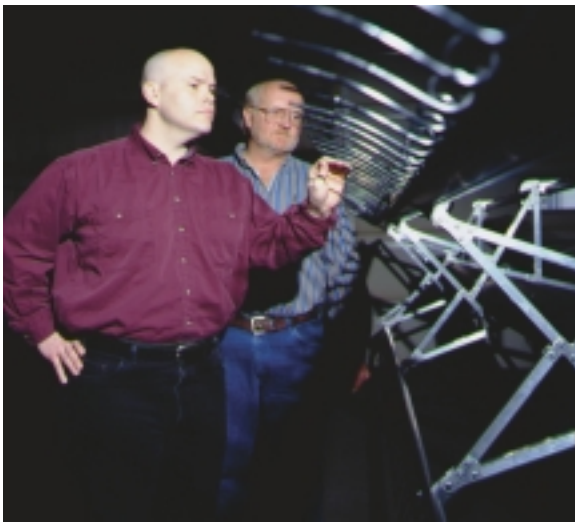
In Pursuit of Quality

IPRT helps an Iowa manufacturer keep and gain business by improving product quality.

Quality products are essential in today's competitive markets. And so it is that Universal Harvester Co. of Ames, Iowa and a leading manufacturer of pickup reels for combines, continually strives to improve its product quality. One reason is to ensure that existing customers are satisfied with their products; another is to meet the specifications demanded by potential new customers. IPRT's outreach centers provided invaluable assistance to help UHC on both of these fronts.



Universal Harvester's Murray Buchheit (right) studies the tines on one of the company's combine reels with ICAP's Paul Berge. IPRT has assisted the company on several projects to help it improve the quality of its products.

The Failure Sleuth

An essential component of combine reels is a spring-like tine, used by the hundreds on a typical reel to rake crops into the combine. When a UHC customer in Canada reported that tines on its reels were breaking, the company quickly moved to find out why. The problem wasn't readily apparent, so UHC called Paul Berge, a scientist with IPRT's Iowa Companies Assistance Program and an expert in understanding why metal components fail.

Berge started his detective work by looking at broken tines, but they didn't provide any clues since the condition of the fracture surface wasn't good. Next, Berge took some supposedly good tines, froze them with liquid nitrogen, and broke them. An examination of the resulting fracture surfaces with a scanning electron microscope showed what was happening. "If there was already a small crack in the tine, it would break easily at that location," said Berge.

More clues were revealed when Berge looked at unbroken tines from the Canadian reels. These tines, too, had small cracks. Using the SEM, Berge found road salt and rust in the cracks. The salt had probably gotten into the cracks during shipping. Finally, an examination of brand new tines also revealed small cracks.

From these clues, Berge made a conclusion with larger implications. "The road salt simply amplified the underlying problem," he said. "The crack was probably in most of the tines even before they were shipped." Berge deduced that the cracks were a result of a forming problem that exceeded the limits of the tine material.

Berge gave his analysis to UHC, which was able to work with its supplier to remedy the problem by increasing the radius of a bend in the tines and selecting a material that was easier to form. "We've had no trouble since," said Murray Buchheit, vice president of production at the company. Because UHC was able to find and fix the problem, it was able to preserve a customer worth about $750,000 in annual sales. "We were able to remedy the problem and preserve that portion of our business," Buchheit said.

The Deciding Factor

UHC also turned to IPRT when it needed help to justify construction of a costly powder-coating system. Buchheit first called Berge, who put him in touch with Dave Utrata of IPRT's Iowa Demonstration Laboratory. Berge knew that Utrata had done some work in powder coating.

Powder coating is an advanced method of applying a protective finish to products, resulting in a uniform, durable, high-quality and attractive finish. "We are in a highly competitive industry, and to be able to pursue growth opportunities we need to be capable of providing products and services that are in every way competitive, if not superior," said Buchheit. "A powder-coating system would be a big step in that direction."

IDL had the expertise and equipment to help UHC decide if powder coating was as superior as promised. "I did a corrosion study, the effect of which was to quantify how much better powder coating materials was than painting," said Utrata, an IDL scientist.

Armed with this information, UHC opted to build a powder-coating capability of its own. "IDL's assistance with this research was key to our decision-making process," said Buchheit. The company is now building an 8,000 square foot addition to do powder coating, which it plans to have up and running in early 2002. Operating and supporting this system will immediately create two jobs, according to Buchheit. More jobs will follow if this system results in business growth. What's more, the company has been able to eliminate hazardous waste that results from a traditional paint system.